University of Wisconsin-Whitewater
UW Extension University of Wisconsin-Extension
Economics Department, 800 W. Main Street, Whitewater, WI 53190

FISCAL AND ECONOMIC RESEARCH CENTER

UNIVERSITY OF WISCONSIN-WHITEWATER

STUDENT OFF-CAMPUS HOUSING SURVEY

by

Russell D. Kashian, Ph.D.

Fiscal and Economic Research Center
University of Wisconsin-Whitewater
800 W. Main Street, Carlson 4003
Whitewater, WI 53190

June 2009

Staff Paper 09.3

Contributors

Principle Researcher
Russell Kashian, Ph.D.

Data Administration and Auditing
Christie Kornhoff, Academic Department Associate

Data Collection and Entry
Paige Peterson
Rebecca Johnson

Research Associate, Coordination, & Editing
Joseph D. Carroll Jr.

Report Preparation
Joseph D. Carroll Jr.
Justin Kasper
Scott Cerwinka

Focus Group Coordinator
Ronald (Bud) Gayhart

CONTENTS

INTRODUCTION: Off-Campus Student Housing Survey

The City of Whitewater Off-Campus Student Housing Survey was designed to gather information from current students who live both on and off campus to help assess the student's view of student housing. The survey questionnaire was designed by the University of Wisconsin-Whitewater's Fiscal and Economic Research Center, with input from the Whitewater Student Government, the University of Wisconsin-Whitewater, and the City of Whitewater. The study was also financed by these three groups. Survey sponsors were interested in the determinants of demand for student rental property offered through landlords of off-campus student housing. Understanding students' views of demand and utilization is considered critical for planning continual housing issues in the City of Whitewater.

Rental housing and apartments have long comprised an important component of UW-Whitewater students' off-campus living conditions. What leads these students into choosing which housing option they will pursue becomes a critical tool in guiding the spatial direction student housing takes in the City of Whitewater.

To better understand the attributes that determine a UW-Whitewater students' off-campus housing decision, the Fiscal and Economic Research Center located in the University of Wisconsin-Whitewater College of Business and Economics, has conducted a survey to addresses some of the important factors concerning the determinants of rent. Approximately 10,000 UW-Whitewater students were emailed the survey with a letter describing its importance. From this pool, 543 students completed the survey. This resulted in a response rate just under six percent. The survey sponsors were interested in the students housing decision and which factors led them to make their decision. Conclusions drawn from the results of the survey address the areas of rental demand determination.

This paper examines the economic determinants that lead UW-Whitewater students into making off-campus housing decisions. The intent is to provide an opportunity to develop a demand curve for student housing and determine the significant variables in UW-Whitewater students' rent making decision. The research that the Fiscal and Economic Research Center has explored will establish the relationship between several groups of factors that determine UW-Whitewater students' willingness to pay for off-campus housing.

Executive Summary

The Executive Summary focuses on a few of the major issues that will be later explored in the Off-Campus Student Housing Survey Analysis. This report is comprised two major sections. The first section deals with the current and future off-campus housing residents. The second looks at these issues by regressing the rent paid against the determinants of rent. To a limited degree, these approaches help identify, in regards to off-campus housing, the wants and needs of students at the University of Wisconsin Whitewater. This executive summary identifies the current state of the housing demand and those components of demand for housing that exists.

a. The majority of respondents live between one and two blocks away from campus. This suggests that off-campus students prefer to live at a close proximity to campus.
b. The average amount paid in annual rent by a UW-Whitewater student is variable due to inconsistent factors of demand.
c. The most popular type of off-campus housing is a designed multiple dwelling

structure. This includes all respondents, regardless of primary residence location.

d. A majority of property owners include some utility costs within their lease contracts with the tenants.

e. Parking is a major issue for both on-campus and off-campus residents at UW-Whitewater. A majority of off-campus housing property owners charge their residents for parking. A majority of landlords charge $180 to $199 annually to park in their units.

The Student Housing Rent Survey also focuses on issues for next year's off-campus housing circumstances. Further analysis will show that most respondents believe that their payments for rent and utilities will be similar to this year's.

f. Respondents agreed that knowing the landlord's reputation was a high priority in choosing their off-campus housing residence for next year. Nearly 66% of respondents agreed on this point.

g. A majority of the respondents strongly agreed that having their own bedroom was a high priority in choosing their off-campus housing residence for next year; 65% of respondents strongly agreed on this point.

h. The majority of respondents indicated that they anticipate paying $3000 to $4999 for off-campus housing next year, during the academic year. This amount reflects the current cost of rentals in Whitewater.

i. A majority of respondents, 51%, indicated that they only saw 1 to 2 housing units before signing their lease. This suggests that the respondents already had an off-campus housing unit in mind based.

The third section of the Student Housing Rent Survey focuses on general information about the respondent.

j. The primary mode of transportation to get to campus for off-campus respondents is walking. This suggests that many respondents chose off-campus housing based on the ability to walk to campus instead of having to use another mode of transportation.

The second portion of the Student Housing Rent Survey focuses on the determinants of demand for student housing in an attempt to develop a demand curve.

k. When the survey results are evaluated with a hedonic regression, it is found that landlord reputation is not a significant component of rental demand. Early in the process, the Whitewater Student Government expressed interest in the components of demand for student housing. A focus group was conducted (headed by Ronald Gayhart of the Small Business Development Center) to determine the components of the survey tool; this revealed the single most desired characteristic of landlords: responsiveness to repairs.

l. A second primary concern expressed by the students was the availability of their own bedroom and the housing unit's geographical relationship to campus.

I. Student Housing Survey Results and Descriptive Statistics

Throughout this report, questions will be evaluated in two fashions. The first is "how did the students respond in the current time frame. In essence, the question asks how much rent the respondent is currently paying. Due to the fact that 43% of the respondents currently live on-

campus, they are not included in the initial half of the survey. However, the second half of the survey asks the students about their future housing decisions. All respondents had the opportunity to answer these questions.

The initial question asked whether the students lived in on-campus housing or off-campus housing. The 57.2% who answered "yes" were then prompted to the next question. The remaining 42.8% were prompted to the later section regarding next year's housing plans.

Do you currently live in on-campus housing

	Count	*Percent*
No	237	42.8%
Yes	317	57.2%

Current Off-Campus Respondents

While the majority of UW-Whitewater students live in the City of Whitewater, the determinants of student rent also include students residing in different communities.

Do you live in the City of Whitewater

	Count	*Percent*
No	92	29.5%
Yes	220	70.5%

Those students who live in the City of Whitewater tend to group themselves relatively close to campus (1 to 4 blocks away from Campus).

How many blocks from campus do you live

	Count	*Percent*
1 - 2	142	64.5%
2 - 4	45	20.5%
5 +	33	15.0%

Disregarding location of primary residence, the majority of respondents live in an apartment complex.

What type of building do you currently live in

	Count	*Percent*
House	43	18.1%
Duplex	41	17.3%
Apartment	153	64.6%

Disregarding location of primary residence, the majority of respondents live in housing units with 2 to 3 occupants.

How many people currently live in the rental

	Count	*Percent*
Live Alone	39	16.6%
1 Roommate	86	36.6%
2 Roommates	48	20.4%
3 Roommates	21	8.9%
4 Roommates	18	7.7%
5+ Roommates	23	9.8%

Disregarding location of primary residence, the majority of property owners do not include parking expenses within their lease contracts.

Is parking included at no additional charge

	Count	*Percent*
No	131	54.6%
Yes	109	45.4%

Disregarding location of primary residence; there was no apparent difference in the amount paid for parking between respondents when parking was not included as part of the lease.

What is the amount you spend on parking? (Annual Total)

	Count	*Percent*
$20 - $99	34	26.6%
$100 - $179	29	22.7%
$180 - $199	45	35.2%
$200+	20	15.6%

There were no respondents who did not have a lease. The most common type of lease for off-campus housing is a 12 month lease.

What is the term of your current lease

	Count	*Percent*
Monthly	9	3.8%
Semester	31	13.1%
9-Month	23	9.7%
12-Month	174	73.4%

Property owners offer two types of leases to the students. According to the respondents, semester rent payments are more common.

How often are your lease payments

	Count	*Percent*
Monthly	82	34.6%
Semester	155	65.4%
9-Month	0	0.0%
12-Month	0	0.0%

A majority of respondents do not plan to remain in the same unit for next year's residence.

Do you plan on living in the same unit next year

	Count	*Percent*
No	154	65.0%
Yes	83	35.0%

Property owners have the option to include or exclude utilities cost for their rent payments. A majority, by a slight margin, of respondents indicated that utilities are included within their rent payments.

Are utilities included in your lease payments

	Count	*Percent*
No	115	48.5%
Yes	122	51.5%

From the respondents who indicated that their utilities are included within their rent payments, we wanted to know precisely which utilities were included in their rent. A majority of respondents indicated that electricity was not included within their rent payments.

Is electricity included in your lease payments

	Count	*Percent*
No	95	77.9%
Yes	27	22.1%

A majority of respondents indicated that water was included within their rent payments.

Is water included in your lease payments

	Count	*Percent*
No	7	5.7%
Yes	115	94.3%

A majority of respondents indicated that cable television services were not included within their rent payments.

Is cable TV included in your lease payments

	Count	*Percent*
No	96	78.7%
Yes	26	21.3%

A majority of respondents indicated that internet services were actually included within their rent payments.

Is internet included in your lease payments

	Count	*Percent*
No	36	29.5%
Yes	86	70.5%

If electricity is not included as part of the lease payments Utility cost can vary from residence to residence, the study found that the majority of respondents pay between $20-39 per month for electricity use.

How are your electric payments

	Count	*Percent*
Included	35	14.8%
$1-$19	17	7.2%
$20-$39	55	23.2%
$40-$59	51	21.5%
$60-$79	31	13.1%
$80+	48	20.3%

The vast majority of respondents indicated that water was included within their rent payments; this is more than likely due to the cost of providing separate hot water facilities for each leased unit by the landlord.

How much are your water payments

	Count	*Percent*
Included	140	59.1%
$1-$19	22	9.3%
$20-$39	46	19.4%
$40-$59	20	8.4%
$60-$79	8	3.4%
$80+	1	0.4%

A vast majority of respondents indicated that natural gas was included within their rent payments, but the majority who do not have natural gas included within their rent payments pay between $40-59 a month. However, it is possible that the respondents who listed natural gas as included, do not have any natural gas service in their unit.

How much are your natural gas payments

	Count	*Percent*
Included	162	68.4%
$1-$19	10	4.2%
$20-$39	17	7.2%
$40-$59	25	10.5%
$60-$79	10	4.2%
$80+	13	5.5%

While the majority of respondents indicated that cable television was included within their rent payments; those who do not have the cable TV included within their rent payments usually pay between $20-39 a month for cable.

How much are your cable TV payments

	Count	*Percent*
Included	89	37.6%
$1-$19	21	8.9%
$20-$39	37	15.6%
$40-$59	35	14.8%
$60-$79	29	12.2%
$80+	26	11.0%

Most respondents indicated that internet services are actually included within their rent payments, but for those who actually do have to pay for internet pay between $20-39 a month for internet usage.

How much are your internet payments

	Count	*Percent*
Included	134	56.5%
$1-$19	21	8.9%
$20-$39	44	18.6%
$40-$59	29	12.2%
$60-$79	8	3.4%
$80+	1	0.4%

According to respondents, a majority of them currently enjoy living in their own bedroom off-campus.

Do you have a private bedroom

	Count	*Percent*
No	31	13.1%
Yes	206	86.9%

Listed in Table B.1 are the answers to the question asked respondents if certain amenities were included within their unit or within the building, in which the unit resides. Listed in Table B.2 are the answers to the question asked respondents which additional amenities were included in their lease.

Next Years Off-Campus Respondents

The next series of questions were designed to collect data on next year's off-campus residents. The majority of respondents currently plan on living off-campus next year.

Do you plan on living off-campus next year

	Count	*Percent*
No	269	48.6%
Yes	284	51.4%

From the respondents who indicated that they plan on living off-campus next year a

Table 3: Variable Descriptions Model 2

Variable	Description
ProxTCamp	Represents the importance of being close to campus for the tenant
Roommates	The number of people the respondent lives within the same rental unit
ElecInclu	Whether the respondent's Landlord pays for electricity or not
IntInclu	Whether the respondent's Landlord pays for internet or not
PrivBed	Whether the respondent has a private bedroom or not
UnitsVisit	The number of rental units visited before the tenant signed a lease
M2M	Whether the respondents lease agreement is on a month to month agreement or not
S2S	Whether the respondents lease agreement is on a semester to semester agreement or not
9Month	Whether the respondent has a 9 month lease agreement or not
LLRep	Represents the importance of the Landlords reputation when renting from them

The $\delta_1 - \delta_{10}$ are the estimated coefficients that measure the effect the respective independent variable has on *RentPMT*, where *RentPMT* is the calculated amount spent on rent each month by an individual. The ε represents the error in the equation from measurement, omitted variables, and other factors, and δ_0 represents the constant that assumes any expected value of the error term and the value of monthly rent paid if none of the variables had an effect on *RentPMT*. The results of the Robust Standard Errors Regression on Model 2 are listed in Table-4.

Table-6: Model 2 RSE Regression

Calculated Monthly Rent Payment			
	Coefficient	(S.E.)	(t)
(Constant)	352.332	32.78	10.748
Importance of being close to campus *	29.896	17.172	1.741
Number of roommates living with ***	-15.368	4.305	-3.570
Electricity is paid by the landlord ***	64.533	24.371	2.648
Internet is paid by the Landlord	-6.292	19.642	-0.320
Have your own private bedroom **	38.269	17.191	2.226
Number of units visited before signing lease	-2.598	4.21	-0.617
Lease is a month to month agreement ***	-72.736	26.701	-2.724
Lease is a semester to semester agreement **	-48.144	19.474	-2.472
Lease is a nine month agreement	-7.951	24.481	-0.325
Importance of Landlord reputation	12.61	18.559	0.679
Fit Statistics			
R-Square	0.1179		
F-Statistic [P-Value]	5.128	[0.000]	

*** Coefficient is significant, with less than a 0.01 probability of a Type-I Error

** Coefficient is significant, with between 0.01 and 0.05 probability of a Type-I Error

* Coefficient is significant, with between 0.05 and 0.10 probability of a Type-I Error

For the second model, a different sample was selected than the first. The same rental requirements were used for the second model, the reason for the differences between the two groups is the natural decay from people graduating, and the entrance of current students that lived in the residence halls currently and will be living in an apartment for next year; the new incoming leasee's represent 67% of the total sample size. Several of the question in this section of the survey were lickert scale questions. For reason to incorporate these questions into the regression model, the scale was change to be interpreted as 0 for not important and 1 for important. The not important level would include the statement of disagree, strongly disagree, and neutral; though these statements are not the same, the indication is that these respondents are not concerned with agreeing with the statement.

From the second model you can expect that if living close to campus is important for the tenant you can expect an increase of $29.90 in the amount of calculate monthly rent payment, holding all other independent variables constant. As the first model established, the closer you are to campus, the greater premium you will pay. Thus if being close to campus is important to you, this will increase your willingness to pay. However, the question does not judge whether being proximate means close to campus or further away, only that this relationship matters. This result is significant on the 10% level.

The number of roommates that a tenant is going to live with significantly impacts the amount of calculated monthly rent payment. In this model, for each additional person you live with you can expect the amount of calculated monthly rent payment to decrease by $15.37, holding all other independent variables constant. Thus if you and someone else were similarly situated, and the only difference between you two is that you have two more roommates than the other. Then you can expect the amount of calculate rent payment to decrease by $30.74. This result is significant on the 1% level.

If the landlord pays for the electricity versus a landlord the does not, you can expect the amount of calculated monthly rent payment to increase by $64.53, holding all other independent variables constant. This would make sense, because if the only difference between to tenants is that one has a lease agreement that includes electricity and the other does not, then the landlord has more of a cost incurred from the unit and would need to increase the amount of rent paid. This result is significant on a 1% level. While the electricity is a significant determinant for rent paid, we could find no evidence from this model that whether the landlord paid for internet or not had any effect on the amount of calculated monthly rent payment; holding all other independent variables constant.

Similar to the first model, if the tenant has a private bedroom, you can expect the calculated monthly rent payment to increase by $38.27; holding all other independent variables constant. For the same reasons listed in model one, we can expect the same interpretation for private bedrooms; and thus we are able to call having a private bedroom a robust indicator between the two models. This result is significant on 5% level. We could find no evidence that the number of units visited before signing a lease had any impact on the calculated monthly rent payment, holding all other independent variables constant.

However, if the lease agreement was a month-to-month basis, you can expect to pay $72.74 less than if it was a 12-month agreement. At the same time, it should be noted that only two respondents responded that their lease agreement was on a month-to-month basis. Thus, the sample did not collect enough variability, for this reason, even though the result is significant, we are not going to consider month-to-month agreements to be a determinant of calculated monthly rent payments. Nevertheless we do accurately see that if you lease is on a semester to semester basis you can expect to pay $48.14 less than someone else similarly situated, holding all other independent variables constant. Finally,

we could find no evidence that having a 9 month lease has any affect on the calculated monthly rent payment holding all other independent variables constant.

The determinant of whether landlord reputation is a significant factor of calculated monthly rent payments, was used in the second model, and used in the first as a forward looking model. In both circumstances we could find no evidence that landlord reputation had any effect on the calculated monthly rental payments.

Conclusion

There are some clear patterns that emerge when we analyze the demand for student housing. In both the regression and the descriptive statistics, location is paramount. One of the most interesting issues is the limited number of housing units students visit prior to their decision. The average is less than one and the mode is one. If there are any policy decisions to be made from this analysis, it could be considered helpful to require students to visit two properties prior to signing a lease. This would be the responsibility of a student housing authority. The other option would be to eliminate the use of application fees which create a "sunk cost" in the decision making process.

The other issue that is paramount is that students highly value their own bedrooms and are willing to pay for this amenity: for every additional roommate that you live with the expected amount of the calculated monthly rent payment would decrease by $7.41. Other amenities such as air conditioning, dishwashers, and garbage disposals, while having value to some individuals, do not rise to a statistically significant level.

Location is a very important issue for students. From the second model you can expect that if living close to campus is important for the tenant you can expect an increase of $29.90 in the amount of calculate monthly rent payment, holding all other independent variables constant. As the first model established, the closer you are to campus, the greater premium you will pay.

A consideration when conducting a demand based study is the recognition that current economic conditions may be driving the rent equation. Since demand curves evolve from utility curves, there may be some substitution effect and income effect in the determination of the curve. As a result, an additional study, conducted in a different economic milieu may be warranted.

References

Allen, M. T., et al. (1995). Implicit pricing across residential rental submarkets. The Journal of Real Estate Finance and Economics. 11. Pp. 137-151.

Benjamin, J. D., et al. (1997). Security Measures and the Apartment Market, Journal of Real Estate Research. 14. pp. 347–58.

Brown, G. M., Jr. and H. O. Pollokowski. (1977). Economic Value of Shoreline. Review of Economics and Statistics, 59. Pp. 272–78.

Christie, H. et al. (2002). Accommodating Students. Journal of Youth Studies, 5, pp 209-235.

François Des Rosiers, F and M Thériault. (1994). Implicit Prices of Rental Services: Modeling the Quebec Market, Assessment Journal, 1. pp 47–60.

François Des Rosiers, F and M Thériault. (1996). Rental Amenities and the Stability of Hedonic Prices: A Comparative Analysis of Five Market Segments. The Journal of Real Estate Research. Pp 17-36.

Griliches, Z. (1971). Hedonic price indexes revisited. Price Indexes and Quality Change (Editor). Massachusetts Harvard University Press.

Guntermann, K. L. and S. Norrbin. (1987). Explaining the Variability of Apartment Rents, AREUEA Journal. 15. pp. 321–40.

Jaffe, A. J. and R. G. Bussa. (1975). Using a Simple Model to Estimate Market Rents: A Case Study. Appraisal Journal, 45, pp 7–13.

Jud, G. D. and D. T. Winkler. (1991). Location and Amenities in Determining Apartment Rents: An Integer Programming Approach. Appraisal Journal, 59. pp. 266–75.

Lancaster, K. (1971). Consumer Demand: A New Approach, New York: Columbia University Press.

Marks, D. 1984. The Effect of Rent Control on the Price of Rental Housing: A Hedonic Approach. Land Economics. 60. Pp. 81-94.

Ogur, D. (1973). Higher Education and Housing: The Impact of Colleges and Universities on Local Rental Housing Markets. American Journal of Economics and Sociology, 32. pp 387–94.

Ozanne, L. and S. Malpezzi, (1985). The Efficacy of Hedonic Estimation with the Annual Housing Survey: Evidence from the Demand Experiment. Journal of Economic and Social Measurement. 13. pp. 153–72.

Rosen, S., (1974). Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition. Journal of Political Economy, 82. pp. 34–55.

Rugg, J. et al. (2002). "Studying a Niche Market: UK Students and the Private

Rented Sector". Housing Studies, 17, pp. 289–303.

Sirmans, G. S. and J. D. Benjamin. (1991). "Determinants of Market Rent". Journal of Real Estate Research, 6, pp. 357–79.

Sirmans et al. (1989). Determining Apartment Rent: The Value of Amenities, Services and External Factors. Journal of Real Estate Research. 4. pp. 33-44.

Sirmans, G.S., et al (1990). Rental Concessions and Property Values. Journal of Real Estate Research, 5. pp.
141-151.

Smith, H.C. and J.D. Belloit. (1987). Real Estate Appraisal, 2nd Edition. Century VII Publishing. New York.

Smith, C. A. and M. Kroll. (1988). Improving Estimates of Potential Gross Income in Multifamily Properties through Market Research. Appraisal Journal. 1. Pp. 118–25.

Waddell, P., et al. (1993). Residential Property Values in a Multinodal Urban Area: New Evidence on the Implict Price of Location. Journal of Real Estate Finance and Economics. 7.. pp. 177-141.

Waugh, F.V. (1928). Quality Factors Influencing Vegetable Prices. Journal of Farm Economics. 10. pp. 185-196.

Wheaton, W. C. and G. Nechayev. (2005). Does Location Matter? The Journal of Portfolio Management. 1. pp. 1-9.

Appendix A: Technical Report

The City of Whitewater Student Housing Survey was conducted by the University of Wisconsin-Whitewater Fiscal and Economic Research Center between January, 2009 and May, 2009. Surveys were mailed to 1121 randomly selected property owners in Whitewater. Two hundred sixty nine (269) surveys were completed and returned by mail. The response rate for the survey was 23% (Table A:1.)

Table A:1 Response Rates

Completed Surveys	269	23%
Non-returned surveys	910	77%
Total	1121	100%

Sampling Error

The City of Whitewater Student Housing Survey, like all surveys, is subject to the existence of Confidence Intervals and Statistical Sampling Error. While error caused by statistical sampling is only one type (others include sample selection bias, social desirability bias, etc), the calculation of this error is important. This Survey, like all survey instruments, is subject to sampling error due to the fact that all households in the area were not interviewed. The sampling error is calculated as follows:

$$\text{Sampling Error} = \pm(1.96) * \sqrt{\frac{P * (100 - P)}{N}}$$

Where P is the percentage of responses in the answer category being evaluated and N is the total number of persons answering the particular question. Turning to the t-distribution and a two-tailed test, the sampling error provides that the probability is 95% that the results fit within this range.

This report presents values that are bounded by this 95% confidence interval estimate. Thus some answers provide a plus/minus range. However, due to the nature of Likert scaling, this type of probability estimation is not applied to all univariate answers. While results can be estimated, their meaning (in regards to Likert scaling) lacks decisiveness.

For example, suppose you had the following distribution of answers to the question, "Should the state spend more money on road repair even if that means higher taxes?" Assume 1,000 respondents answered the question as follows:

Yes - 47%
No - 48%
Don't Know - 5%

The sampling error for the "YES" percentage of 47% would be:

$$\text{Sampling Error} = \pm(1.96) * \sqrt{\frac{47 * (100 - 47)}{1000}} = \pm 3.1\%$$

The sampling error for the "Yes" percentage of 48% would be:

$$\text{Sampling Error} = \pm(1.96) * \sqrt{\frac{48 * (100 - 48)}{1000}} = \pm 3.1\%$$

The Sampling error for the "Don't Know" percentage of 5% would be:

$$\text{Sampling Error} = \pm(1.96) * \sqrt{\frac{5 * (100 - 5)}{1000}} = \pm 1.4\%$$

In this case we would expect the true population figures to be within the following ranges:

Yes	43.9% - 50.1% (i.e., 47% ±3.1%)
No	44.9% - 51.1% (i.e., 48% ±3.1%)
Don't Know	3.6% - 6.4% (i.e., 5% ±1.4%)

Chi Square Test

In its simplest fashion, the chi-square test is used to test the difference between two independent proportions. In one instance, this report considers the difference between groups in their view on affordable single-family housing (are single family home prices reasonable?). This question was exposed to a chi square test, which tested the answers against the different groups answering the question. It was found that given the degrees of freedom given, and chi-square value exceeding 37.652 prompted a rejection of the null hypotheses (all groups feel the same).

The chi-square test is commonly used in political polling. Suppose, for example, a pollster is interested in knowing whether males and females differ in their endorsement of a candidate. The null hypothesis is that females and males are just as likely to support a candidate. If 33% of the 100 males interviewed support the candidate while 17% of the females support the candidate, it is important to test whether the difference was due to chance alone.

The chi-square test provides a simple mechanism to test whether certain group's responses fall outside the expected range, given the group's response. This study uses a standard significance level of 5%. This significance level makes the statement that sampling variation is an unlikely explanation of the discrepancy between the null hypothesis and the sample values.

Appendix B: Tables

Table B.1: What amenities are included in your lease

	No	%	Yes	%
Dishwasher in unit	107	45%	130	55%
Garbage Disposal in unit	149	63%	88	37%
Washing Machine in Unit	134	57%	103	43%
Washing Machine in Building	115	49%	122	51%
Central A/C in unit	164	69%	73	31%
Window Unit A/C	126	53%	111	47%

Table B.2: Which additional amenities are included with your lease

	No	%	Yes	%
Cable Television	86	36%	151	64%
Satellite Television	203	86%	34	14%
Internet	93	19%	144	61%
Pets (Dogs or Cats)	128	54%	109	46%